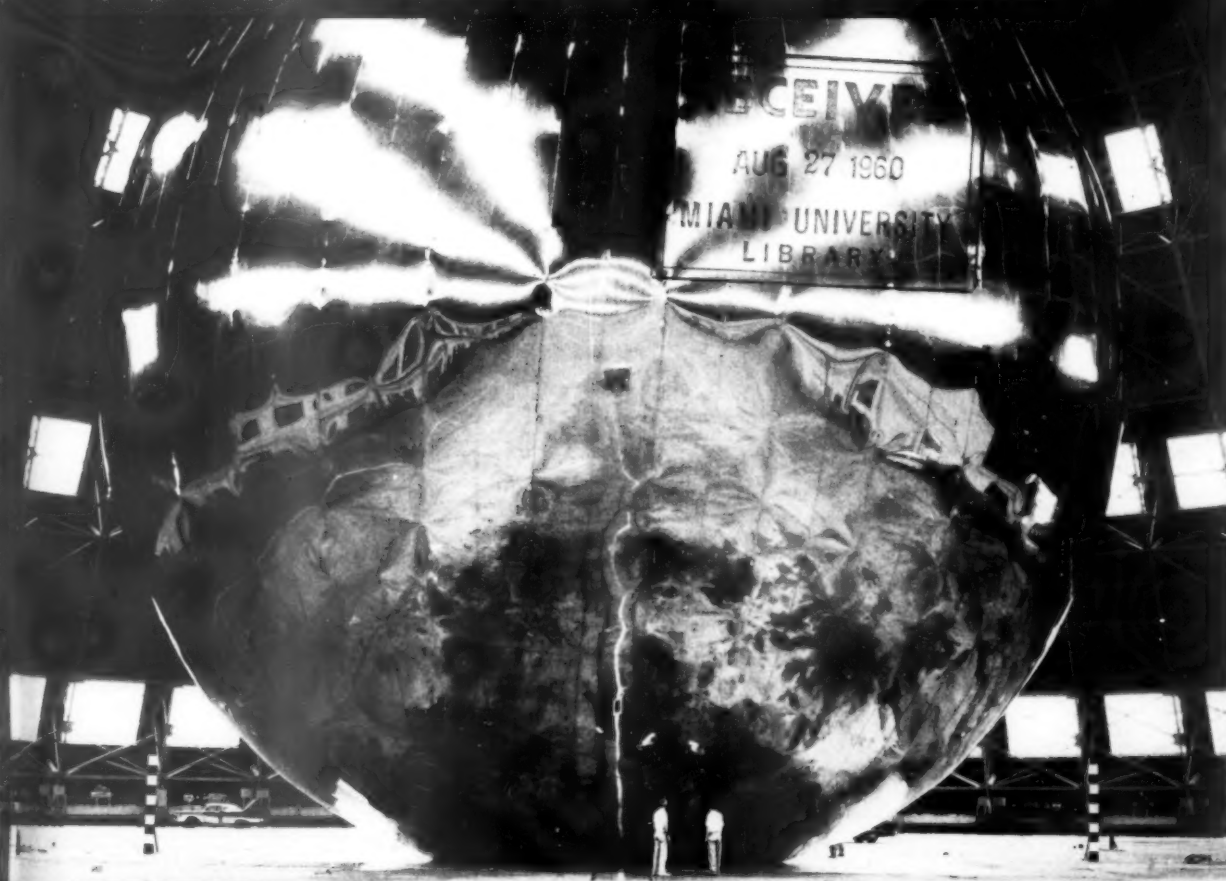


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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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A SCIENCE SERIES PUBLICATION

## SATELLITES

# Echo Success Story

## See Front Cover

► **THE ECHO SATELLITE** launched Aug. 12 (see SNL, 78:114, 1960) has swung around and around the earth, visible as far north as the United States-Canadian border and as far south as the tip of South America.

Looking like a moving star of zero magnitude, the 100-foot-diameter sphere has been easy to see.

Via the new satellite, radio messages have been bounced from coast to coast. Echo has been hailed as a big step forward in communications.

The launching was part of a long-range National Aeronautics and Space Administration program designed to investigate the feasibility of global communications systems using satellites. The moon has been used as a natural communications satellite.

During the last few years, it has been increasingly apparent that communications lines are becoming overcrowded. Telephone and telegraph lines are barely able to keep up with the demand. Future demands on transoceanic telephone cables, which are already carrying a heavy burden, will continue to grow.

## ASTRONAUTICS

# Show Astronaut Shuttle

► **A BELL-SHAPED DESIGN** for an astronaut shuttle between space stations and the earth was outlined at the annual West Coast meeting of the American Astronautical Society in Seattle, Wash.

E. F. Styer of Boeing Airplane Company's Aero-Space Division said his investigation of possible vehicles for from one to 50 passengers showed the bell shape was structurally simpler and required less weight per crew member than glide vehicles.

Mr. Styer said the bell-shaped vehicle could have small control flaps and would use small rockets for establishing desired re-entry conditions. Parachutes and inflatable impact bags would be used for landing.

His studies were made of vehicles re-entering the atmosphere at more than six miles a second—about the speed of vehicles returning from the moon, other planets or distant earth satellites.

A "sausage skin" area for repairing ailing spacecrafts was also proposed at the meeting. E. J. Merrick, project engineer in General Electric Company's Missile and Space Vehicle Department at Philadelphia, suggested in a report that repair drydocks in space "could be as simple as a plastic 'sausage skin' drawn over and around the craft and then inflated, or they could be as complex as a geodesic sphere."

The drydocks would be inflated with gases fed from a mother ship or other sources. Inside, comfortably-suited men could work in a life-sustaining atmosphere.

And a Princeton, N. J., engineer told

In spite of Echo's success, scientists are not predicting the end of telephone and TV transmission as it is known today. They do, however, think that earth satellites will someday provide a much greater capability for global communications. Experimentation in this direction will one day lead to worldwide TV, for instance. In the years to come, communications satellites might also serve as relay stations for messages to and from space vehicles.

The inflatable sphere, shown on the cover of this week's **SCIENCE NEWS LETTER**, was fabricated of Du Pont Mylar polyester film, about half the thickness of the cellophane on a cigarette package, covered with vapor-deposited aluminum to provide radio wave reflectivity of 98%, up to frequencies of 20,000 megacycles.

Before launching, about 30 pounds of sublimating powders were inserted in the sphere. It was then folded accordion-fashion and placed inside a 26½-inch-diameter magnesium container which carried it into orbit.

About two minutes after the payload was injected into orbit, the magnesium container was split open by an explosive charge placed around its middle. The in-

flatable sphere was released from its container and gradually began to inflate with the expansion of the small amount of residual air left inside. Thirty pounds of sublimating powders caused additional inflation: 10 pounds of benzoic acid provided the initial expansion and 20 pounds of anthraquinone provided for sustained inflation.

The two primary stations taking part in the Project Echo communications experiment have been Bell Telephone Laboratories' facility at Holmdel, N. J., and the NASA-Jet Propulsion Laboratory's Goldstone station in California. Radio signals were bounced between the east and west coasts of the U. S. via the orbiting satellite.

During the experiments, BTL transmitted on a frequency of 960 mc/s for reception at Goldstone. JPL transmitted at 2390 mc/s to BTL on the east coast.

• Science News Letter, 78:130 August 27, 1960

## ROCKETS AND MISSILES

## Discoverer Well Enough Insulated for Animal

► **THE INTERIOR** of the 30-by-27-inch Discoverer XIII capsule is sufficiently insulated to protect a small animal riding in it from the terrific heat to which the exterior is exposed on its return to earth. Lt. Gen. Bernard Schriever, Commander of the Air Research and Development Command, has reported.

When the scorched lid of the gold-plated aluminum space traveler was removed, its instruments were found to be unmarred.

Gen. Schriever said that although all the temperature data had not yet been fully processed and evaluated, all indications were that interior heat would not be a matter of concern when an animal is sent aloft.

The 12,000-mile ride to earth was fully telemetered; but instruments inside the capsule recorded data on tape to permit a full and complete reconstruction of the entire performance of the Air Force space probe ride.

The Discoverer XIII capsule, the first man-made object to be recovered from orbital flight in outer space, made its debut at the White House before President Eisenhower and a host of dignitaries from Government, the Air Force and industry.

The golden space explorer, looking like an instrumented kettle drum, contained a special 50-star American flag which was presented to the President by Gen. Thomas D. White, Air Force Chief of Staff, who noted that the capsule began its return to space over Alaska, the 49th state, and was fittingly recovered in the waters near Hawaii, the 50th state. The President, on behalf of all Americans, expressed pride in "this remarkable achievement" and his personal appreciation for whoever thought of "the thoughtful gesture of this flag." Col. Roy Allison is the Air Force officer who included the flag in the Discoverer capsule.

The top of the instruments, packaged by Lockheed Aircraft Corporation, had a small white seal inscribed, "O. K. to install cover. This one's coming back home."

• Science News Letter, 78:130 August 27, 1960

the meeting tomorrow's space stations and some satellites could be built with balloon-like tubes that inflate in space with a plastic foam that would become hardened in the sun's heat.

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## PHYSICS

## Highest Magnetic Fields Produced at Los Alamos

► **THE HIGHEST MAGNETIC** fields known have been produced at Los Alamos Scientific Laboratory, using the technique of implosion, the inward direction of explosive forces, which is also one method for detonating atomic bombs.

A thin copper tube was imploded by high explosives and a large volume of initially weak magnetic field was compressed up to a strength of 14 million gauss in a volume of about one cubic inch by Drs. C. M. Fowler, W. B. Garn and R. S. Caird. The achievement of such a strong magnetic field, which lasted for two-millionths of a second, is reported in *Science*, 132:187, 1960, by Dr. Harold P. Furth of the University of California's Lawrence Radiation Laboratory.

The gauss is a unit measuring magnetic strength. The earth's magnetic field averages less than one gauss. One application of very high magnetic fields is in the confinement of a hot plasma in a "magnetic bottle," the major problem in the control of fusion power for peaceful purposes.

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## ASTRONOMY

# Maps for Moon Landing

The first known photogeologic study of the moon identifies many distinctive features—craters, fracture patterns, faults, anticlines and monoclines.

► THREE MAPS to be used for selecting landing sites on the moon have been drawn by the Department of Interior's Geological Survey. They indicate the moon's surface is softer and less craggy than was once thought.

The maps and a table, produced for the U.S. Army Engineers, represent the first known photogeologic study of the moon. They will also be used as an aid in designing telemetering instruments and a lunar surface vehicle.

Some astronomers may disagree with some of the Geological Survey's conclusions concerning how lunar formations occurred. Other Survey conclusions, such as that the craters were formed by meteors smashing into the surface, are generally accepted.

One map shows the physiographic regions of the moon, each one named and outlined. Many distinctive physical features are also identified and named.

Another map is a generalized photogeologic map of the moon, showing craters and such structural features as fracture patterns, faults, anticlines and monoclines.

A third map depicts the prominent lunar "rays," which look through a telescope somewhat like cracks in glass. The rays are interpreted as splashes of crushed rock derived from the impact of large fragments thrown out at the time of meteoric impact.

Some rays extend hundreds of miles from their craters of origin.

Among the factors of lunar environment considered in the study were that the moon's gravity is only one-sixth that of earth, that there is no water or atmosphere and therefore no erosion, and that temperature changes are extreme.

One of the possibly controversial conclusions is that the level maria, or seas, resulted from tremendous outflows of lava. Another is that dust on the moon is only a very thin layer, less than an inch thick.

The table includes an evaluation of the difficulties of landing and movement, and of construction, at various selected regions. Research and compilation for the study were done by Arnold C. Mason and Robert J. Hackman, who used three-dimensional viewing to examine lunar photographs.

Another new map of the moon will soon be published by the U. S. Naval Observatory in Washington, D. C. This contour map shows the 300-mile-wide band that is only occasionally visible from earth since the moon does not always present exactly the same surface to earth. The Naval Observatory moon map was prepared under the direction of Chester B. Watts, who was also consulted by the U. S. Geological Survey.

• Science News Letter, 78:131 August 27, 1960

## AERONAUTICS

# High Altitude Jump Made

► THE HIGH ALTITUDE Project Excelsior balloon flight and parachute jump Aug. 16, by Capt. Joseph W. "Red" Kittinger Jr. (USAF), set new world records. He stepped down from an open gondola 102,800 feet above the earth; fell freely 85,300 feet; opened his chute at 17,500 feet; and reached ground safely in 13 minutes and 8 seconds.

The 32-year-old, red-haired parachutist broke his own previous jump record of 14 miles. He also broke the world record for manned balloon flight set three years ago, almost to the day (Aug. 19, 1957) in the Air Force Man High II ascent by Col. David Simons, Holloman Air Force Base, New Mexico. Capt. Kittinger's more than 16-mile free fall through space before opening his parachute broke his own previous free fall record of 66,400 feet (approximately 13 miles). The combined time of the ascent and jump was less than two hours.

Project Excelsior is a special "manned space probe" designed to test man's endurance and his ability to escape from high-flying aircraft.

Going up in the balloon-suspended open

gondola, Capt. Kittinger was exposed for more than an hour to all the physical hazards of space except weightlessness. High-altitude pressures above 60,000 feet are such that his blood would have boiled and his lungs have ruptured if he did not have the protection of an oxygen-equipped, pressurized space suit.

His protection from the more than 60 degrees below zero temperatures were the long-johns worn under the pressure suit, topped off with a quilted two-piece garment and an intermediate flying suit; electrically heated wool socks; electrically heated flying gloves; and a heated space helmet "to prevent fogging." Full body protection against the cold would have meant adding to the 155 pounds of bulky suit, parachute and special equipment Capt. Kittinger had to carry with him, in addition to his own weight of 150 pounds.

"It is more important that I be able to move and perform the necessary escape functions efficiently than that I be comfortably warm," Capt. Kittinger said. "At any rate, I believe I have demonstrated that if hands, feet and face are warm,

man can endure extremes of cold for long periods of time without peril."

Air Force parachutists have conditioned themselves to the low temperatures of high-altitude jumps by being lashed to a cot and exposed for seven minutes to 100-mile-per-hour winds at 65 degrees below zero temperatures, protected by space and flying suits that are not heated.

This preparation is done at the huge "weather factory" at Eglin Air Force Base Climatic Center Hangar in Florida, Capt. Kittinger's home state. Both men and materials may be exposed here to all extremes of weather to measure survival limits.

Prior to take-off Capt. Kittinger breathed oxygen for almost four hours. In the days before the scheduled jump he was fed a special low-residue diet. If it was on the skimpy side, it was so on Capt. Kittinger's orders.

"I'd rather be a little hungry than an over-stuffed, inefficient astronaut," he explained.

Before Project Mercury, the man-in-space program of the National Aeronautics and Space Administration, Capt. Kittinger was among those men of the Air Force considered qualified by training and motivation for the hazards of pioneer space flight.

He is an experienced jet pilot, trained parachutist and balloonist, and a veteran of more than four years of extensive and highly stressful tests. He is attached to Wright Air Development Division, Wright Field, Dayton, Ohio, and works under the direction of Col. John Paul Stapp, a pioneer in aerospace medicine.

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**PROJECT EXCELSIOR—Capt. Joseph W. Kittinger Jr., first to make an ascent to 102,800 feet, wears the space suit that protected him from fatal exposure.**



# SCIENTIA INTERNATIONAL

## NOVAS DEL MENSE IN INTERLINGUA

**Astronautica.**—Le radiation cosmic representa un grande problema technic pro le astronautica del futuro, sed il pare possibile que iste problema va esser solvite sin provider le integre astronave con un pesante armatura anti-irradiation. Il pare certe que radios cosmic va esser incontrate solamente in zonas intermittente, e on ha proponite includer in le construction del naves un micre e fortissimemente protegite "camera de securitate" al qual le astronautas pote retirar se durante periodos de periculo. Normalmente le astronautas occuparea un inarmate section de lor nave, le qual—in consequentia del reducite peso—poterea esser concipite in forma plus confortabilemente spatiose.

**Morphinismo.**—Le habitation a morphina (o derivatos de morphina) affice le feto in le utero de matres morphinista, proque le placenta non representa un barriera al circulation de tal drogas. Post nato, le symptoms de dishabituation in le infante pote esser si violente que le infante mori. Super le base de extense experientias con casos de iste genere, duo pediatrias del Universitate New York insiste que neonatos ab matres morphinista require le mesme tractamento como morphinistas adulte, incluse un lente e progressive dishabituation con le uso possibile de progressivamente minus forte equivalentes de morphina.

**Agronomia.**—Muscas in gallinieras es un plaga, specialmente in le caso de gallinas ponente. Insecticidas chimic existe, sed le currente trend es reguardar los como suspecte: Illos intraina le periculo de residuos toxic in ovos e aves; illos es costose; e illos pote perder lor efficacia quando le muscas disveloppaa immunitate contra illos. In California on ha trovate un simplissime solution del problema: On introduce in le stabulos del gallinas greges de neonate gallos que devora omne le ovos de musca que illos pote trovar. Juvene gallos non es periculose pro le gallinas. Juvene gallos es incostose. E le muscas non deveni immun contra illos. In un del gallinieras que ha essayate le methodo, 750 gallettos sufficeva pro dismicar 35,000 gallinas ponente. On crede que quando le problema es sever, un juvene gallo va esser necessari pro omne 10 a 20 gallinas.

**Radio-Astronomia.**—Le potentia de radio-telescopos depende del dimensiones de lor antenas. Al laboratorio Cavendish a Cambridge in Anglaterra, Drs. M. Ryle e A. Hewish ha succedite a "fabricar mathematicamente" un enorme e enormemente efficace antenna ex duo comparative micre antenas de typo conventional. Le duo es actuate simultaneamente, sed durante le observation illos es movite le un in relation al altere in un maniera que permette le combination computatori del productos del duo, resultant in informationes que poterea esser producite per un antenna unic solamente si illo habeva dimensiones vermente gigante.

**Hygiene Social.**—Le governmento statunitense expende omne anno plus que tres milliardos dollars pro sanitate, sanitation, e fines affin.

**Physica.**—Le studio de undas de choc del magnitudine de illos occurrente in detonationes atomic ha devenite possibile a base experimental gratias al discoperta que comparative leve explosiones produce enorme undas de choc si le carga es detonate al puncta de un tubo conic o fundibuliforme. Le explosion de mille libras de TNT al puncta de un cono de 700 m de longor con un angulo de convergentia de un medie grado produce un unda de choc que es le equivalente de illo producite per le bomba atomic de Hiroshima. Iste discoperta esseva

facite al laboratorio naval de White Oak in Maryland. Illo va esser specialmente importante pro le studio de undas de choc in medios altere que le aere.

**Chimia.**—Le utilisation agricultural de substantias chimic como pesticidas, fertilisantes, etc. non es disprove de riscos e periculos. Le autoritates in le stato de California annuncia que in le anno 1957, 749 casos de maladia chimo-genic esseva reportate. Un caso esseva mortal. Un aspecto specialmente problematic del situation es que multes del agentes in question exerce lor effectos toxic trans le pelle, e le notion de invenenamento transcutanee es apparentemente difficile a comprender pro le publico general.

**Medicina.**—Inter le agentes bacterial de infectiones in le hospitales del Statos Unite, staphylococcus es hodie le plus importante, tanto con respecto al incidentia del morbos causate como etiam con respecto al mortalitate pro le qual illos es responsabile. In 1935 le incidentia del infectiones staphylococcal e etiam del mortes causate per infectiones staphylococcal esseva minus que 20 pro cento. Hodie iste proportion es 40 pro cento. Dr. M. Finland del Universitate Harvard, qui ha facite iste constata-tiones, explica los per un crescente tendentia del parte del personal hospitalari de negliger multe regulas de antiseptis, credente que on pote fider se del efficacia de antibioticos, ben que il es un ben cognoscite facto elementari que *Staphylococcus aureus*, per exemplo, non es susceptible al action de antibioticos.

**Vitaminologia.**—Vitamina A es indispensable al function del senso gustatori. Esseva trovate per experimentatores al Hospital Judee de Long Island que animales laboratorial que es private de vitamina A non pote distinguer aqua pur ab aqua fortemente contaminate per quinina.

**Oceanographia.**—In studios de currentes subsuperficial del mar, le statunitense Bureau pro Observations Costal e Geodetic va servir se de paracadites del typo usate in le aere. Ille paracadites va esser relaxate a profundores de inter 5 e 300 m, attachate solamente a boias de flottation libere que indica per lor displaciamento le displaciamento del paracadites.

**Recercas de Poliomyelitis.**—In su evaluation comparative del vaccinos antipoliomyelitic morte e vive, Dr. S. M. Clemmesen de Danmark nota que le uso del vaccino vive in le vaccination de solamente un micre segmento de un population particular intraina le risco que le attenuate virus restabli su virulentia in le curso de su transmission ab un subjecto al altere. In vaccinationes del population plus o minus total iste risco es sin signification.

**Communicationes.**—Le programma del Prime Congresso International de Endocrinologia a Copenhagen in Danmark contine summarios de omne reportos presentate (1) in le lingua usate per le autor e (2) in interlingua. Le textos in interlingua amonta in lor totalitate a plus que 300.000 parolas. Le labor gigante del traductiones esseva complete per seniores Bjarner Sveigaard e Poul Moth de Copenhagen in collaboration con le Division de Interlingua de Science Service.

**Physica Atomic.**—Le capacitate de strontium-90 de passar ab le terra via plantas e animales a in le organismo human es grandemente restringite si le terra in question se distingue per un alte contento de calcium. Strontium-90 pote insinuar se in organismos vive in loco de calcium, sed il pare que illo succede le melio in isto in le presentia de un deficit de calcium.

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### GENERAL SCIENCE

## Reading Interlingua

YOU CAN READ Interlingua if you had no more than one semester of high school French or Spanish or Latin and flunked it. You can read and understand a great deal of it even if you have never had contact with any foreign language.

Twenty-three medical journals regularly publish in Interlingua abstracts of their original papers.

Send this page to an acquaintance abroad and tell him that he can get additional information about Interlingua from Alexander Gode, SCIENCE SERVICE's Interlingua Division, 80 E. 11th St., New York 3, N. Y.

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## PSYCHOLOGY

# Cat Phobia Treatment

► IF YOU ARE "scared to death" of cats, it may help to wear velvet gloves.

Dr. H. L. Freeman of Littlemore Hospital, Oxford, and Dr. D. C. Kendrick, lecturer in psychology at the University of London's Institute of Psychiatry, report a case in which a patient was cured of cat phobia by forcing herself to handle velvet until she got used to it.

The patient, a 37-year-old married woman with two children, had had a fear of cats as long as she could remember. It had intensified in the two years before she consulted a psychologist. The interview revealed that the situations that produced fear were, in order of importance: the sight of a real live cat; the thought of a cat that might attack her as she walked down the street; the thought of meeting a cat in the dark; cats in pictures and on television; cat-like toys and cat-like fur.

She was not afraid of a cat's meowing and could easily touch the hair of a dog.

On two occasions as a child she had been very disturbed in situations involving cats. One was when her father drowned a kitten in her presence and the second was when her parents put a fur in her bed.

The patient was eager to overcome her fear and agreed to undergo learning and behavior therapy, more specifically "reciprocal inhibition," a technique derived from experimental psychology.

The therapist began by trying to teach the patient to accept what she felt was the least objectionable idea associated with cats—their fur. To do this, a number of materials were prepared. The first was velvet, which has some of the texture of cat fur. Gradually the patient progressed until she could be comfortable with a rabbit-fur glove, a toy kitten and pictures of cats.

The psychologist then picked out a live kitten with a mild disposition and gave it to the patient, who laughed and cried as she accepted it. She explained later that she wept because of the relief of having done something she thought impossible for her. Acceptance of the kitten occurred one month after therapy began.

The patient took the kitten home to keep and as it grew she became less and less afraid of full grown cats. Eventually the patient was able to pet her mother's black cat, which had seemed particularly frightening to her.

"Whereas previously all cats had an almost uniformly sinister aspect," the psychologists report in the British Medical Journal, Aug. 13, 1960, "she could now see individual differences."

Dr. Freeman was at Bethlem Royal and Maudsley Hospital, London, while conducting the investigation.

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## MEDICINE

# Leprosy Patients Helped

► THE WORLD is suddenly faced with millions of leprosy patients who want to earn a living. Leprosy can often be cured by new techniques and many patients can be rehabilitated, according to Dr. Paul W. Brand, member of the World Health Organization expert panel on leprosy.

Dr. Brand says attitudes toward this formerly incurable disease have changed. Not only can leprosy be cured, reconstructive operations are now possible for the mutilations and paralysis caused by it.

There are only some 2,000 leprosy patients in all of the United States. Few physicians in this country are trained to care for them. Throughout the world there are about 12,000,000 sufferers.

Writing in *Rehabilitation Literature* 21:239, 1960, Dr. Brand says:

"In Vellore, India, one of the most effective methods of altering public opinion has been the integration of treatment of leprosy with that of other diseases in the Medical College and its outclinics, along with the establishment of a leprosy rehabilitation center in the town, where it can be seen and visited by the public."

Dr. Brand describes the results of leprosy—lack of sensation in hands and feet, collapse of the nose, deformities of the external ear, paralysis of eyelids and other muscles. But he adds:

"The disease does not affect the heart or lungs, the digestion, central nervous system, the urinary system, or any of the nerves, muscles, bones, or joints supporting the pelvis, abdomen, thorax, neck, upper arm, hip or thigh."

A plastic surgeon—who can make post-nasal inlays, followed by cartilage grafts, face-lifting operations and eyebrow grafts—may restore a victim's face to normal.

Eyelid slings or muscle transplants are needed for paralyzed eyelids to prevent blindness from exposure of the cornea.

"Whereas in poliomyelitis," Dr. Brand explains, "a limb may be totally paralyzed and beyond the reach of surgical help, in leprosy a whole group of forearm muscles remains unparalyzed and can be redeployed to transform a useless hand into a strong and active member."

Up to now, Dr. Brand says, leprosy has not been thought of as a disease but as a curse to be turned over to missionaries or dedicated physicians who devote their lives to lepers.

If international agencies will initiate a program to establish training units in medical colleges and to provide rehabilitation teams in a few antileprosy areas, Dr. Brand predicts, the governments of the countries concerned will quickly see their value and shoulder their responsibilities.

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**SACRED IMAGE**—Copy of deity-image found near Vernon, Ariz., by a Chicago Natural History Museum archaeologist.

## ARCHAEOLOGY

## Rare Sacred Image Of Pueblos Unearthed

► A RARE SACRED IMAGE of key importance in the Pueblo Indians' religious ceremonies in Arizona between 1250 and 1350 A.D. has been discovered. The deity-image, in a pose like that of a dog begging for a bone, is the first of its kind to be unearthed.

Although it has remained buried for six or seven centuries, the image may be related to underworld ceremonies that are still part of the religion of today's Hopi Indians.

Nine inches high, carved in sandstone and painted black, orange, green and blue, the image was found in a secret crypt by Dr. Paul S. Martin, chief curator of anthropology at the Chicago Natural History Museum. The crypt was at a site near Vernon, Ariz.

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## NAVIGATION

## Lighthouses Offshore To Replace Lightships

► LIGHTSHIPS will soon be replaced by fixed offshore lighthouses, the U.S. Coast Guard has announced. A long-range program will eliminate 22 of the remaining 24 picturesque lightship sites.

Completion of the first new navigation aid, to be at the southern approach to the Cape Cod Canal off the Massachusetts coast, is anticipated by the end of 1961 or early in 1962. Lighthouses are cheaper and will provide a greater luminous range than lightships.

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## ASTRONOMY

# Jupiter Still Conspicuous

Jupiter is still prominent in the sky, but the chief events on the September celestial calendar are two eclipses, one of the moon, the other of the sun.

By JAMES STOKLEY

▶ WITH THE ARRIVAL of September, Jupiter is still the most conspicuous of the stars or planets seen in the evening sky. And near this planet there is another—Saturn—considerably fainter but still prominent.

Both of these objects are shown on the accompanying maps. These depict the sky as it appears about 10 p.m. your own kind of standard time (add one hour for daylight saving time), an hour earlier in the middle of September and two hours earlier at the end.

Both are in the southwest, in the constellation of Sagittarius, the archer, with Jupiter toward the right. Earlier in the evening than the hours for which the maps are drawn they will be visible higher, and toward the east.

The brightest star of these evenings is Vega, in Lyra, the lyre, which you can see high in the west. Just above it—practically overhead, in fact—you will find Cygnus, the swan. Part of this star group is shown on our northern sky map, part on the southern. In it is the star Deneb, which is rated by astronomers, like Vega, as of the first magnitude. So is Altair, high in the south, in Aquila, the eagle.

Three other first-magnitude stars appear near the horizon, so their low altitude causes a considerable diminution in their brightness. This is due to increased absorption of their light as it has to pass through a greater thickness of the earth's atmosphere than if the star were overhead.

One of these stars is Fomalhaut, toward the southeast in Piscis Austrinus, the southern fish. To the northeast you will find Capella, in Auriga, the charioteer, while Arcturus, in Bootes, is toward the northwest.

There are a number of other constellations which contain no first-magnitude stars but are still of considerable interest. Toward the northeast, for example, are five stars forming a letter W resting on its left-hand side; this is Cassiopeia, the queen. Her husband, the king Cepheus, is next to her, to the left, below Cygnus.

Farther left you will find the snakelike form of Draco, the dragon. The head is at the top, and the figure winds downward until it ends just above the bowl of the great dipper, part of Ursa Major, the great bear. And Ursa Minor, the little bear, is between Draco and Cassiopeia. In it is Polaris, the pole star.

Another prominent "landmark" of the sky is the "great square," toward the east. Most of this figure is in Pegasus, the winged horse, which is just below Cygnus, but the northernmost star in the square is in Andromeda.

Two other planets are now visible during the evening hours, but not at the proper time to get them on our maps. Look toward the western horizon soon after sunset and you may see Venus, which is even brighter than Jupiter. It sets less than an hour after the sun, while the sky is still quite bright, which makes it hard to find. And a little before midnight Mars rises in the east. It is in Taurus, the bull, which is next to Aries, the ram, a group that is shown.

## Two Eclipses Visible

The chief events on the celestial calendar for September are two eclipses, one of the moon, the other of the sun, both of which will be visible over a large part of the United States and Canada. The first, a total lunar eclipse, occurs during the night of Sept. 4-5. Then, on Sept. 20, comes a partial eclipse of the sun.

Both earth and moon, like any solid body, cast shadows into space, on the side away from the sun, and these shadows consist of two parts. The full shadow, called the umbra, is at the center; in this region the sun's direct light is cut off entirely. Around this is a partial shadow, the penumbra. Here the earth or moon only partly hides the sun.

Every time the moon is full it is in the opposite direction from the sun. You might think that this would invariably bring the moon into the earth's shadow, and that we would have an eclipse of the moon every time it is full. But generally at this phase the moon is well to the north or south of the earth's shadow, even of the penumbra.

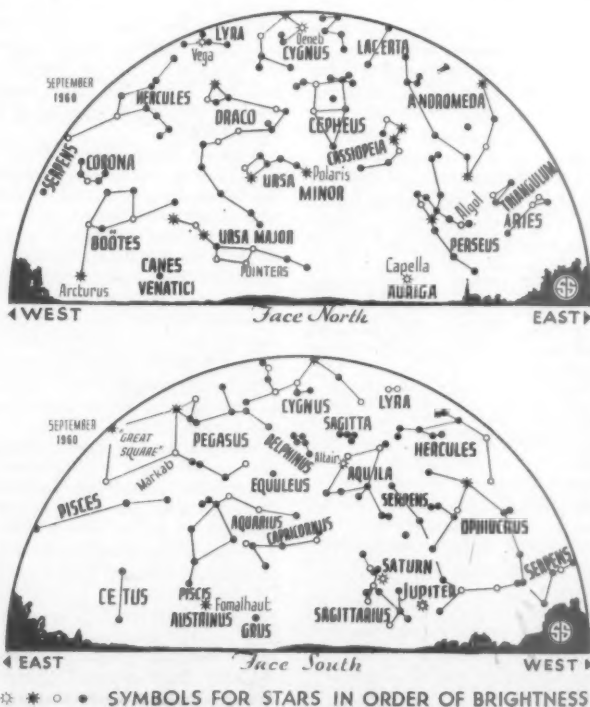
Similarly, when it is new, the moon is approximately between earth and sun, but generally the lunar shadow passes north or south of earth, and there is no eclipse. However, at the time of the September full moon, early Monday morning, Sept. 5, moon, earth and sun will be directly in line, so there will be a total lunar eclipse as the earth cuts off our sunlight.

Along the Atlantic seaboard sunrise occurs just about the time the total eclipse is beginning, so people in that part of the country will see only the first partial phases. Farther west there will be a better view, and the entire eclipse will be visible along the Pacific Coast.

If you get a good view, you will see:

First of all, even though the moon is in the penumbra, there will not be much effect and it will look as it does normally when full. Then, at Stage I, the eastern edge of the moon will begin to dim, and for the next hour the edge of the umbra will creep across the lunar disc.

From II to III moon will be totally eclipsed—but it will not be dark. Instead it will have a coppery red glow, caused by sunlight bent around into the umbra by the





earth's atmosphere. As it goes through, the blue light is scattered, to give the daytime sky its blue color, and the light that falls on the moon is reddened. Between III and IV the edge of the umbra will again be seen creeping across the moon's face, until finally it will be shining again, as it was before the eclipse started.

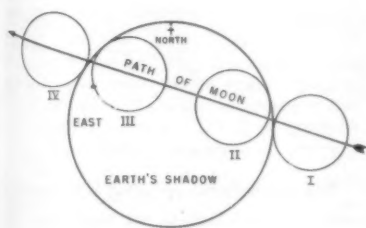
About two weeks after this, on Sept. 20, as the moon has gone half of an orbital revolution around the earth, its shadow will fall on our planet. This will only be the penumbra; the umbra will not reach us. Consequently, at no place on earth will the sun be totally hidden. Again the eastern seaboard misses the show, for eclipse starts after sunset in this part of the country.

Along a line running approximately from Montreal to Mobile, Ala., the eclipse will begin just as the sun is setting; to the west of this line, therefore, something may be seen. And in the western third of the nation sunset will not come until the eclipse is over.

The farther north one happens to be, the longer the eclipse will last. Near San Diego it will be about 40 minutes from start to finish, while near Eureka, Calif., it will last about 50 minutes. Near Seattle, however, it will last a full hour.

First you will see a slight nick in the edge of the solar disc, as the moon starts to encroach upon it. This will get larger, until the maximum eclipse, and then it will get smaller, as the event comes to an end.

If you live in a region where the eclipse is visible, be sure to use some protection for the eyes when watching it. Looking at the sun without adequate protection can cause irreparable harm to the eyes. Several thicknesses of exposed photographic film serve the purpose. Sunglasses are **NOT** sufficient protection.



### Total Eclipse of Moon— Night of Sept. 4-5, 1960

The large circle represents the shadow of the earth, and the small circles indicate the successive positions of the moon as it passes through the shadow. At I the moon starts into the shadow; at II the total eclipse begins and the middle of eclipse occurs; at III the total eclipse ends; at IV the moon leaves the shadow. The four phases occur at the following times (all a.m.):

	EST	CST	MST	PST
I	4:36	3:36	2:36	1:36
II	5:38	4:38	3:38	2:38
	6:21	5:21	4:21	3:21
III	7:05	6:05	5:05	4:05
IV	8:07	7:07	6:07	5:07

(Continued on p. 143)

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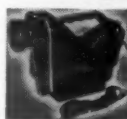
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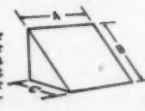
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# October

## SCIENCE YOUTH MONTH



To inspire and inform youths in our schools as to the opportunities, need and qualifications of scientific and technological manpower.

Millions of youths in schools, science clubs, and science fairs throughout the nation provide the nucleus of this National Science Youth Month emphasis on science activities.

### ✓ CHECK YOUR ACTION PROGRAM . . . NOW

☐ NOW . . . Organize **local National Science Youth Month Committee**, based on local science fair or academy or technical council group.

☐ NOW . . . Organize **information material** for use during October. Use it in newspapers, radio, television. Circulate information to schools, teachers, industries, colleges, scientists, engineers.

☐ NOW . . . Devote an October meeting of your school's **Parent-Teacher's Association** to science youth activities—science clubs, science fairs, hobbies, etc.

☐ NOW . . . Ask all professional and technical **societies to devote one meeting** during October to science youth power.

☐ NOW . . . Stock your **career guidance shelf** with up-to-date literature on opportunities in science, mathematics and engineering.

☐ NOW . . . **Place your subscriptions** to magazines covering the field of science

and mathematics, and enter or renew memberships in professional societies.

☐ NOW . . . Organize **plant tours** for the coming school year so that they will be most convenient for pupils and plant officials.

☐ SEPT. 15 . . . Teachers should **affiliate** every science group, club, or class in secondary schools with **Science Clubs of America** . . . free handbook, valuable to any teacher. Just write Science Service—"Affiliate my science club."

☐ OCT. 1 . . . Urge **newspapers and radio-television** stations to emphasize science news and feature science youth power during **NATIONAL SCIENCE YOUTH MONTH**.

☐ OCT. 1 . . . **Reorganize for science fairs** to be held next March or April. Reactivate your committees. Make your plans. If you have not had a fair, get one started. Arrange college, industrial, medical society, service club, newspaper and other cooperation.

☐ OCT. 15 . . . Ask for **Science Talent Search examinations** for your most promising seniors. Examinations will be mailed on November 15.

☐ DURING OCTOBER . . . Hold **Career**

**sessions** of science clubs. Ask scientists and engineers to discuss careers in science individually or in groups.

☐ DURING OCTOBER . . . Hold a **Project Night**. Invite scientists and engineers in various fields to a mass meeting of young scientists. Get the professionals and youths working together.

☐ DURING OCTOBER . . . Schools should hold **special assemblies on NATIONAL SCIENCE YOUTH MONTH**. Speakers should be provided by science fair organizations. Read proclamations and messages from officials.

☐ NOW AND ALWAYS . . . Publicize all newsworthy events in your school paper, newspaper, radio and television. **Let people know what you are doing.** Notify Science Service, 1719 N Street, N.W., Washington 6, D.C. of your ideas, so that they may be passed on to others.

The organizations listed have joined with Science Service to organize this national emphasis on science youth power. The National Science Youth Program of Science Service, of which OCTOBER NATIONAL SCIENCE YOUTH MONTH is a part, is partially supported under a grant from the National Science Foundation.

**VOTE THIS FALL FOR SCIENCE! TODAY'S YOUTHS ARE TOMORROW'S SCIENTISTS.**

### Cooperating in National Science Youth Month:

#### American Association for the Advancement of Science

The AAAS administers a Traveling High School Science Library Program and a Traveling Elementary School Science Library Program, sponsored by the National Science Foundation, to stimulate interest in and choice of careers in

science and to assist in improving school instruction in the sciences and mathematics. These libraries are on loan in 1960-61 to approximately 1,700 high schools and preparatory schools and 800 elementary schools. Applications for 1961-62 are invited from principals and headmasters. Address: Dr. H. J. Deason, AAAS. Annotated catalogs of the traveling libraries are available at 25¢ each. Also available are an annotated list of paperback science books (25¢); and a comprehensive list of science books recommended for high school and public libraries

one for elementary school libraries (\$1.00 each available October. Send orders to AAAS Publications. Under a grant from the Carnegie Corporation of New York, the Science Teaching Improvement Program of AAAS is sponsoring a project on Studies in Teacher Education with the cooperation of Bucknell University, Emory University, Hunter College, Oklahoma State University, San Francisco State College, University of Arizona, University of Delaware, Un

Hand these pages to a teacher, student or parent.



versity of Hawaii, and University of Tennessee. Another Study on the Use of Special Teachers of Science and Mathematics in Grades 5 and 6 will be continued in Cedar Rapids, Iowa; Lansing, Mich.; Washington, D. C.; and Versailles, Ky. Small research grants have been made available to staff members in small colleges. A requirement of the research project is that it involve preservice science teachers. A quarterly newsletter, called *Science Education News*, reports education activities of scientific societies. Junior Academies of Science are encouraged through AAAS-affiliated State and City Academies of Science. A Junior Scientists' Assembly is sponsored each year at the annual meeting by the Academy Conference. Grants are given for student projects through the Senior Academies. AAAS, 1515 Massachusetts Ave., N. W., Washington 5, D. C.

#### American Cancer Society

The ACS is carrying out an active career-incentive program. A number of ACS Divisions have provided special training grants for careers in medical technology, and have granted other types of scholarships relating to career training in some instances. Materials and information on cancer may be obtained without charge upon request to the local ACS unit listed in telephone directory.

#### American Chemical Society

ACS members volunteer to give personal assistance to high school science teachers. The ACS will again cosponsor "Continental Classroom" in modern chemistry, which will start in September. This nationally televised course is aimed specifically at the high school teacher of chemistry. Special assistance in connection with this course and other projects can be obtained through ACS members in more than 155 local sections throughout the country. ACS presents awards at the National Science Fair-International and many local sections sponsor award programs. For further information about careers in chemistry, summer employment, speakers, consultants, etc., consult local section officers. Their names and addresses can be obtained from American Chemical Society, 1155 16th St., N.W., Washington 6, D. C.

#### American Dental Association

All state and local dental societies are being urged to participate in science fair activities. Dental societies and dental schools are prepared to offer advice and material assistance to science teachers and students. The ADA presents awards for outstanding exhibits at the National Science Fair-International. A booklet, *Dental Projects for High School Science Students*, is available without charge from many local dental societies; single copies from Science Service (25¢ handling charge; 20¢ each for 10 or more). Dental health and hygiene information described in the Catalog of the ADA (single copy on request) provides some additional background material for science projects. For information and names of local dental society officers, write to Dr. Sholom Pearlman, American Dental Association, 222 E. Superior St., Chicago 11, Ill.

#### American Federation of Labor and Congress of Industrial Organizations

The AFL-CIO supports better schools and encourages scientific education. Many of its affiliated unions conduct apprenticeship schools to transmit skills to young apprentices and the latest scientific processes to journeymen members. Central labor organizations and local unions of skilled workmen in almost every community stand ready to help pupils with their science projects, clubs and fairs. Students

wanting assistance are invited to contact the local union bodies in their home towns or to write the AFL-CIO Public Relations Department at 815 16th St., N.W., Washington 6, D. C.

#### American Heart Association

The AHA is encouraging its affiliates and chapters to cooperate with local, regional and state science fairs and will honor a finalist at the National Science Fair-International. For educational materials relating to heart and blood circulation, fair directors should contact their local Heart Associations.

#### The American Institute of Biological Sciences

The AIBS has several educational activities of interest to teachers. The Institute is especially proud of its Biological Sciences Curriculum Study. This Study is being directed at the secondary level but will eventually include the elementary and college level. The Visiting Biologist Program for High Schools is sponsored by the National Science Foundation and administered by AIBS. Under this program, prominent biologists visit schools from one to three days and talk to students, teachers and other interested groups. Another project, the Secondary Biological Sciences Film Series, is directed primarily at the tenth grade level. The Series will consist of 120 lecture-demonstration films of 30 minutes' duration, each closely correlated with teachers' manuals and study guides. Films are to be available singly, in combination, or as a set. Selected winners of the National Science Fair-International are guests at the AIBS Annual Meeting at which their exhibits are displayed. Write: Educational Activities, The American Institute of Biological Sciences, 2000 P St., N.W., Washington 6, D.C.

#### American Medical Association

County and state medical societies cooperate with local science fairs by joining in sponsoring committees, giving special awards and scholarships, arranging counseling, etc. The AMA presents citations at the annual National Science Fair-International and selected winners are guests at the AMA annual meeting. A 20-min., color, sound motion picture—I Am a Doctor; a large-scale exhibit on Medicine as a Career; and descriptive literature on the study of medicine are available from the AMA via local medical societies. For information write to Leo E. Brown, American Medical Association, 535 N. Dearborn St., Chicago 10, Ill.

#### American Pharmaceutical Association

Through the efforts of the National Advisory Commission on Careers in Pharmacy, which is comprised of representatives of every national organization in the profession, practicing pharmacists are being urged to assist students and their science teachers in the development of science projects. The Commission is coordinated by the APhA, which presents two awards at the National Science Fair-International. A career brochure, *See Your Future in Pharmacy*, two color sound films (one for junior high school age and one for senior high and adults), about the profession of pharmacy and a 20-foot Career Exhibit are available from the APhA. Address: Mr. George B. Griffenhagen, American Pharmaceutical Association, 2215 Constitution Ave., N.W., Washington 7, D. C.

#### American Veterinary Medical Association

Veterinary associations are being encouraged to assist students toward the development of proper scientific attitudes and techniques. Aid to science fair personnel through these associations and their Women's Auxiliaries is being developed. A booklet, *Veterinary Medicine as*

*a Career*, single copies free, additional copies 10¢ each. Sponsors may obtain a list of veterinary medical organizations to contact for direct assistance. The AVMA presents awards at the National Science Fair-International; top award winner is guest at the AVMA annual meeting. Address: Brian M. Forster, Director, Public Information, 600 S. Michigan Ave., Chicago 5, Ill.

#### B'nai B'rith Women

B'nai B'rith Women participates with and contributes to three major youth services: B'nai B'rith Youth Organization, Hillel Foundations and Vocational Service. In these services, direction of young people is carried on by trained personnel. Supervised leisure activities enable youth to explore and express interests and learn skills, while developing healthy patterns of human relationships and fulfillment of responsibilities. Career clinics are conducted to provide guidance in the selection of suitable careers. Write: B'nai B'rith Women, 1640 Rhode Island Ave., N.W., Washington 6, D. C.

#### Chamber of Commerce of the United States

Over 2000 Chambers of Commerce have Committees on Education which have been alerted to the nation's manpower problems and to the need for better career planning by young people. Many chambers have cooperated with school officials in planning and conducting: "Business-Education Days" in which teachers and counselors visit local businesses to learn future career needs; "Education-Business Days" when businessmen visit schools to learn how the teacher can be aided; "Career Conferences for Teen-Agers" in which students have the opportunity to learn the trends in local manpower needs and the types of training required. Business and professional men in every community are ready to work with teachers and administrators to improve guidance programs, to develop science fairs or to secure materials, equipment or work experience to make science teaching more effective. For further information consult your local Chamber of Commerce or write to the U. S. Chamber of Commerce at 1615 H St., N. W., Washington 6, D. C.

#### Department of Defense

The Department of Defense cooperates with individuals and groups in providing guidance and assistance on projects which are designed to stimulate interest in scientific pursuits. This includes speakers' programs, films, furnishing of instructional and informational materials, demonstrations, exhibits and displays of military products, installation tours and briefings, and assistance in certain forms of scientific experimentation. Address: Commanding Officers of local military installations.

#### Thomas Alva Edison Foundation

The Edison Foundation directs programs to encourage boys and girls to undertake careers in science and engineering. The Foundation conducts a public information program for improving the quality and quantity of science education. Science Youth Day, held annually on Thomas Alva Edison's birthday, February 11, is a nation-wide program to interest young people in science and engineering. Participating in this International Edison Birthday Celebration are major companies of American industry, governmental agencies, professional, scientific and educational societies, and other groups in the United States and abroad. Science experiment booklets and other free materials are distributed to students. Student visits to industrial plants and research and development laboratories are arranged. The Foundation organizes national

conferences and Edison Institutes on scientific manpower and science education. Awards are given in the mass media to encourage better program material in sciences. A list of publications is available by writing to Thomas Alva Edison Foundation, Inc., 8 W. 40th St., New York 18, N. Y.

### Engineering and Science Organizations

Each field of engineering has its own professional society and some of these, including the so-called founder societies, are represented by the Engineers Joint Council, 29 W. 39th St., New York, N. Y. Problems of education, personnel, training and utilization are the concern of the Engineering Manpower Commission at the same address, while Scientific Manpower Commission, 1507 M St., N.W., Washington 5, D. C., performs the same function for scientific organizations. Teachers and others may make inquiries on special problems in connection with science, technology and careers. The Scientific Manpower Commission may be consulted on Selective Service and other military problems.

### Junior Engineering Technical Society

Program designed to stimulate and encourage interest in engineering, applied science and mathematics among high school students. JETS chapters are sponsored in high schools by local industry and/or professional groups throughout the United States and two foreign countries. JETS provides free materials for initiating and operating the chapters. The program includes a National Project Exposition with awards and scholarships. JETS offers the students an opportunity to explore the various technical fields and to compare attitudes, interests and abilities with the requirements of technical professions through actual experiences and contacts. Write JETS, P.O. 589, East Lansing, Mich.

### Manufacturing Chemists' Association, Inc.

MCA, representing the chemical manufacturing industry, executes an aid-to-education program that embraces all levels from kindergarten to college. For information, request free copy: *An Industry Helps Our Schools*. Newest free publications: *Guide to Aid-to-Education Materials Available from the Chemical Industry; Counselor's Handbook*. Holt, Rinehart and Winston, 383 Madison Ave., New York 17, N. Y., is now sole distributor of *Scientific Experiments in Chemistry* (for senior highs), of *Superstition to Supersonics* (for junior highs), and *Matter, Energy and Change* (for elementary school supervisors and teachers). For information of MCA's chemistry films ("Combustion"; "Chlorine—A Representative Halogen"; "Oxidation-Reduction" and "Chemistry of Water") write Sutherland Educational Films, Inc., 201 N. Occidental Blvd., Los Angeles 26, Calif. Free publications: *Frontiersman of the Future*, a careers handbook; *Your Food and Chemical Research; Source of Information on Careers in the Scientific Fields; Film Guide on Chemicals, Chemistry and the Chemical Industry; Chemical Industry Facts Book*, single copies with *Teacher's Guide*, 45c to educators. Address: Manufacturing Chemists' Association, 1825 Connecticut Ave., N.W., Washington 9, D.C.

### National Academy of Sciences-National Research Council

Through its Advisory Board on Education the NAS-NRC works with scientists and scholarly organizations for improvement of science education at all levels. Principal attention is given to programs designed to improve the preparation of teachers, at graduate and undergraduate levels, and to expansion of opportunities for continual professional development. Action is being taken to promote better planning for production and use of films and television in

science education. In cooperation with local and national industries and associations, community action is promoted to develop better local understanding and support of schools. Address: Advisory Board on Education, National Academy of Sciences-National Research Council, 2101 Constitution Ave., N.W., Washington 25, D. C.

### National Association of Manufacturers

By encouraging study of science and mathematics in schools, cooperation with local and regional science fairs and the National Science Fair-International, the NAM Committee on Research and Education Department is promoting development of science talent. Career booklets, *Your Career in Industry as a Scientist and Engineer*, and *Your Opportunities in Industry as a Technician*, have been distributed in large numbers. Copies free on request as long as current supply lasts. Address: Education Department, National Association of Manufacturers, 2 E. 48th St., New York 17, N. Y.

### National Aviation Education Council

To help secondary school teachers stimulate interest in science or mathematics as they relate to aviation, NAEC publishes *Science Teaching Aids for a Stronger America* (75c) and *Mathematics Teaching Aids for a Stronger America* (75c). These books offer suggestions for using aviation facts and principles in science and mathematics classrooms; also bibliographical references. *Guidance Aids for a Stronger America* (75c) is a handbook for guidance counselors. *The Arithmetic of Flying* (50c) includes more than 250 arithmetic problems like those pilots of light aircraft solve in order to fly safely. *1960 U. S. Aircraft, Missiles, and Spacecraft* (\$1.00) describes the products of the U. S. aero/space industry today. *The Space Frontier* (25c) gives facts about space and space exploration, and includes a space age glossary. A special *Science-Mathematics Packet* includes 13 books useful in science and mathematics classrooms. The books in the packet list at \$11.00 but are offered at \$8.89 plus postage. This packet includes a bonus of three booklets and a 4-color Astronautic Systems chart, 22" x 46". Established for the purpose of providing aviation and space information to schools, libraries, and individuals, NAEC offers for \$5.00 a year a mailing service through which subscribers receive single copies of all NAEC books published during the membership year, monthly copies of *Aerospace, National Aeronautics and Skylights*, a selection of previously published books, and monthly packets of up-to-date booklets, pamphlets, charts, pictures and instructional materials produced by the aero/space industry. Free teaching aids such as units on rockets and space travel, bibliographies, *Skylights* (an aero/space fact sheet) and a source book (*Pictures, Pamphlets and Packets*) of free and inexpensive teaching aids relating to aviation and space exploration are available to teachers and librarians requesting them on school or library stationery. Address: National Aviation Education Council, 1025 Connecticut Ave., N.W., Washington 6, D. C.

### National Committee for Careers in Medical Technology

This Committee is expanding its awards program for projects related to clinical laboratory medicine. Emphasis is on summer jobs in hospital pathology laboratories for outstanding science students attaining honors at Science Fairs. It distributes career guidance information, including pamphlets and films describing the profession of medical technology, and data on aptitudes, training, qualifications and salaries. NCCMT is sponsored by the American Society of Clinical Pathologists, the American Society of Medical Technologists and the College of American Pathologists. Address: National Committee

for Careers in Medical Technology, 1785 Massachusetts Ave., N.W., Washington 6, D. C.

### National Merit Scholarships

National Merit Scholarships are four-year college scholarships available to high school seniors. The stipend accompanying each scholarship is based on need and may vary from \$100 to \$1,500 a year. Winners choose their colleges and curricula during the competition. A supplemental grant to the college usually accompanies the scholarship award. Last year 831 Merit Scholarships were awarded, including some 512 Merit Scholarships offered by and named for 114 business organizations. Registration for the Merit Scholarship Program is by high school. The National Merit Scholarship Qualifying Test, the first step in the annual competition, is administered to second-semester juniors and first-semester seniors in the spring of each year. Each principal is sent registration materials in September. Any eligible student may take the examination at the cost of \$1.00. The 1960-61 competitions began with the Qualifying Test in March 1960. Winners will be announced in the Spring of 1961. The test for the 1961-62 competition will be given either Tuesday, March 7, or Saturday, March 11, 1961, to students who will enter college in 1962. Since the inception of the Merit Program in 1955, some \$19.5 million in Merit Scholarships have been awarded to 3,937 students. For information see your principal or write National Merit Scholarship Corporation, 1580 Sherman Ave., Evanston, Ill.

### National Science Foundation

This Federal Government agency conducts programs of support and stimulation to science and research, including scientific personnel and education. Most of its operations are through grants that facilitate activities by other organizations. Programs in science education include support of institutes, summer fellowships, and other training programs for high school and college teachers of science and mathematics; research participation and independent study for college undergraduates; limited summer programs for high school students of science and mathematics; traveling science libraries and traveling science demonstration lectures; fellowships for graduate students and advanced scholars in science, mathematics and engineering; and projects for the improvement of course-content materials and the development of new teaching and learning aids in science and mathematics. For information write for *National Science Foundation Programs for Education in the Sciences*, National Science Foundation, Washington 25, D. C.

### National Science Teachers Association

A department of NEA, an affiliate of AAAS. Membership, \$6; includes 8 issues of *THE SCIENCE TEACHER* and the Packet Service. Publications to help students include: *Encouraging Future Scientists: Student Projects*—examples of prize-winning science projects. *If You Want To Do a Science Project*—suggestions to help students plan, carry through, and report science projects. Single copies, 50c; discounts—2 to 9 copies, 10%; 10 or more copies, 20%. Orders for \$1.00 or less must be accompanied by remittance. *Encouraging Future Scientists: Keys to Careers*—bibliography of science career and guidance material. *Careers in Science Teaching*. Single copies free. Order from National Science Teachers Association. Future Scientists of America of NSTA is conducting its 10th annual student awards program in grades 7-12. U. S. Savings Bonds will be awarded regional winners based on reports of individual project in science. Closing date is March 1, 1961. Student entry materials available from National

Science Teachers Association, 1201 16th St., N.W., Washington 6, D. C.

#### National Youth Conference on the Atom

Sixty-two electric utility companies are sponsoring attendance of outstanding high school science students and teachers to the Second National Youth Conference on the Atom, October 20-22, 1960, Museum of Science and Industry, Chicago. "The purpose of the Conference is to present to a group of the nation's most able high school science students and teachers an authoritative and inspiring picture of the promise of the peaceful atom in its various applications, and to help advance interest in the study of science in the United States." Outstanding educators and representatives of the Atomic Energy Commission and industry will participate. Delegates will tour Argonne National Laboratory and Dresden Nuclear Power Station. Eleven organizations, including Science Clubs of America, the American Association for the Advancement of Science and the National Science Foundation, are cooperating. Selection of delegates is carried out locally by school officials working with electric utility companies. Students are selected for scientific interest and achievement, on the basis of academic records and standings in local Science Fairs. For information, query your local electric utility, or write to Electric Companies Public Information Program, 2 W. 45th St., New York 36, N. Y.

#### New England Council

The New England Council has established a Program of Industry Aids to Education, designed to provide a means through which industry, professional societies and schools may work together. The Program is developing this link first in the sciences and math at the secondary and elementary school level on the basis that industry has, through knowledge, experience and resources, the tools to help meet many of the schools' needs. The Program plans to have available listings of industry's resources throughout New England, and source material valuable to teachers. Write: Robert M. Burnett, Industry Aids to Education, New England Council, Statler Building, Boston 16, Mass.

#### Oak Ridge Institute of Nuclear Studies

ORINS is a non-profit educational corporation of southern universities, operated under contract to the U. S. Atomic Energy Commission. Its programs are designed to further the cause of science and science education from the precollege through the postdoctoral levels. Its activities include a program to train secondary school science teachers to become either "traveling teachers" or specialists in their own systems; the administration of graduate fellowship programs, traveling atomic energy exhibits, student tours of nuclear facilities, and a college student training program; the presentation of courses in the use of radioisotopes, special courses for high school and college teachers, and symposia and conferences; the maintenance of a medical research hospital, a museum of atomic energy, and a technical library; and the provision of lecturers for universities, research opportunities for university scientists, and a mobile radioisotopes laboratory for on-campus college training. No program of the Institute is limited to participation by member universities. Address: Oak Ridge Institute of Nuclear Studies, P.O. Box 117, Oak Ridge, Tenn.

#### Optical Society of America

OSA has an active career-incentive program. A booklet, *Careers in Optics*, is being prepared to answer students' questions about "What optics is," "What optics does," etc. Some corporations which employ opticians tell what each is doing in the field of optics—space exploration, astronomy, steel industry, vision or fiber optics,

which enables one to see around corners!—and the careers available to young men and women when they graduate from college. OSA has seven sections: Rochester, N. Y.; Boston, Mass.; Detroit, Mich.; Chicago, Ill.; Niagara Frontier; South Western Connecticut; and Southern California, which welcome young scientists to their meetings (write to your local section and ask for a program). OSA Student Memberships are available at \$2 a year. These give students the right to attend OSA meetings and to receive publications of the Society. OSA particularly welcomes teachers and students at a seminar on "The Teaching of Optics" to be held during the Fall Meeting in Boston, Mass., at Somerset Hotel, October 12-14, 1960. OSA will make an award at the National Science Fair-International. Citations and book awards will be offered to regional fairs. For information about careers in optics, summer employment opportunities, speakers and information about OSA local sections, write: Executive Office, Optical Society of America, 1155 16th St., N.W., Washington 6, D. C.

#### Science Service

Science Service is the non-profit institution for the popularization of science, with trustees nominated by the NAS, NRC, AAAS, E. W. Scripps Estate and the journalistic profession. It operates as a news service to newspapers and magazines, publishes magazines, issues experimental kits, conducts Science Clubs of America, Science Talent Search, and National Science Fair-International. More than 600,000 youths are in some 25,000 Science Clubs of America. Adult sponsors are invited to affiliate groups, clubs, classes, and receive free annual SCA sponsor handbook and other materials. The Science Talent Search is conducted by Science Clubs of America and sponsored by the Westinghouse Educational Foundation. High school seniors may win trips to Washington, share \$34,250 in scholarships and awards, and be recommended for admission and support in college. The 20th Science Talent Search begins in December 1960. Teachers should ask for examinations about Oct. 15. Completed entries must arrive at Science Service not later than midnight, Dec. 27, 1960. *How You Can Search for Science Talent* sent free on request. Young scientists in secondary schools show science projects and exhibits in thousands of science fairs. The best of these compete in regional fairs, which will send their two top finalists to the 12th National Science Fair-International to be held May 10-13, 1961, in Kansas City, Mo. For information, write Science Service. Free material available on various activities and samples of publications sent on request. *SCIENCE NEWS LETTER*, weekly summary of current science, \$5.50 a year, trial \$3.13 for 41 weeks; *CHEMISTRY*, eight times a year, \$4 a year; *THINGS OF SCIENCE*, monthly experimental kits, membership \$5 a year, collection of 8 kits, \$3.75; *Thousands of Science Projects* listing titles of exhibits, 25¢ a copy, 10 copies 40¢; *Science Service Books*, each \$2 postpaid: *Science Exhibits*, *Scientific Instruments You Can Make*, *Organic Chemistry for the Home Lab*, *Experimenting with Chemistry*. *The Chemical Elements*, 55¢ each postpaid, 10 for \$5.00. *Color Slides of the National Science Fair*, 6 sets available, \$6 each. *Color Slides of the Science Talent Search*, 1 set, \$6. Science Service, 1719 N St., N.W., Washington 6, D. C.

#### Scientific Apparatus Makers Association

SAMA represents some of the nation's principal manufacturers and dealers in the scientific laboratory and equipment industry. It is concerned that educators and students have at their disposal the finest and most up-to-date tools of their profession. Through yearly awards, cooperation with Federal educational agencies and

direct liaison with leading professional societies, the SAMA supplements its member companies' efforts to better prepare our nation's scientists and engineers. Leaflets and reprints of published articles available without charge: *Selected Bibliography on Science Education and Careers*, *A Guide to Evaluating Your Science Facilities*, *Your Career with the Instrument and Control Industry by the Recorder-Controller Section*, *How to Help Your Town's Editor*, *I Am the Science Teacher*, *SAMA Motion Picture Film Directory*. Address: Director of Public Information, Scientific Apparatus Makers Association, 20 N. Wacker Dr., Chicago 6, Ill.

#### Society of American Bacteriologists

Many Local Branches of the SAB have committees which provide speakers on microbiological topics and give aid to biology students and teachers. SAB Committee on Education issues certificates of commendation to students, and their teacher sponsors, who win awards for exhibits in microbiology at district, regional and state science fairs, and certain Local Branches give additional awards of \$25 for first place winners. SAB sponsors awards at the National Science Fair-International. Suggestions for experiments, projects, lists of films, references and other teaching aid material have been published by the Committee as a special issue (June 1960) of *The American Biology Teacher*. Teachers may obtain this publication from the Executive Secretary, SAB. Information relating to the above and a copy of a career brochure may be obtained free. A list of universities offering degree programs in bacteriology and/or microbiology is available at 50¢. Address: Raymond W. Sarber, Executive Secretary, Society of American Bacteriologists, 19875 Mack Ave., Detroit 36, Mich. A 15-minute color movie, "A Career in Bacteriology," may be rented or purchased from Audio-Visual Center, Indiana University, Bloomington, Ind., and other sources.

#### U. S. Air Force

The U. S. Air Force will participate in this year's National Science Fair-International on an enlarged basis. Additional categories of competition within aerospace fields and more awards are being planned. The program calls for continued recognition at the regional levels in addition to the National finals. Details will be forwarded to all fair directors.

#### U. S. Army and the Association of the U. S. Army

The U. S. Army and the Association of the U. S. Army will expand its awards in the National Science Fair-International. Exhibits judged will be in the specialized areas of missiles, satellites, electronics, calculators, mathematics, high and low temperatures, meteorology, medicine, biochemistry, geodesy, and textiles. The Army Association will honor students at its 1961 national convention in Washington, D. C. Increased support will be provided to local and regional fairs by area commands.

#### U. S. Navy

The U. S. Navy requests each fair affiliated with the National Science Fair-International to select one male sophomore or junior high school student whose exhibit is considered best in the broad area of Navy-oriented projects. District Commandants and members of Naval Reserve Units are requested to contact Fair Directors and offer to assist the judges in the selection of Navy Science Cruise winners. One student from each fair will be given an opportunity to see science in the Navy on fleet ships at sea. The U. S. Navy will honor students at the 12th National Science Fair-International.



# Books of the Week

For the editorial information of our readers, books received for review are listed. For convenient purchase of any U.S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C.

**ADVANCES IN ELECTRONICS AND ELECTRON PHYSICS**, Vol. XII: Photo-Electronic Image Devices—J. D. McGee and W. L. Wilcock, Eds.—*Academic*, 397 p., illus., \$12. Proceedings of the Symposium on Image Tubes and Related Devices, held in London, September 1958.

**ADVANCES IN X-RAY ANALYSIS**, Vols. I-III—William M. Mueller, Ed.—*Plenum Press*, 494 p., 359 p., and 376 p., illus., \$8.50, \$8.50 and \$12. Proceedings of the Sixth, Seventh and Eighth Annual Conference on Applications of X-Ray Analysis held in August 1957, 1958 and 1959, respectively.

**BEYOND MARS**—William Nephew and Michael Chester—*Putnam*, 72 p., illus. by Walter Bucher, \$2.75. Missile experts describe in simple language for boys and girls the difficulties and problems a trip to one of the outer planets would entail.

**BIOCHEMISTRY OF PLANTS AND ANIMALS: An Introduction**—M. Frank Mallette, Paul M. Alt-house and Carl O. Claggett—*Wiley*, 552 p., illus., \$8.50. Mainly intended to provide a general knowledge of biochemistry for students in the agricultural sciences.

**THE CHORD OF STEEL: The Story of the Invention of the Telephone**—Thomas B. Costain—*Doubleday*, 238 p., illus., \$3.95. Tells of the eventful years when the Bell family lived in Brantford, Ontario, during which time Alex-

ander Graham Bell demonstrated his successful tests which resulted in the invention of the telephone.

**CONCISE DICTIONARY OF SCIENCE: Physics, Mathematics, Nuclonics, Astronomy, Chemistry**—Frank Gaynor—*Littlefield*, 546 p., paper, \$2.25. Provides concise definitions of terms and concepts, including such newer sciences as virology, cytogenetics, radio-chemistry, high-energy and solid-state physics.

**DIRECTORY OF UNIVERSITY RESEARCH BUREAUS AND INSTITUTES**—*Gale Research Company*, 199 p., \$20. A guide to college and university-sponsored institutes, experiment stations, laboratories and research organizations carrying on continuing research programs, including life sciences, mathematics, meteorology and many other specialized fields.

**DRAGONFLIES AND DANSELFLIES**—Mary Geisler Phillips—*Crowell*, 95 p., illus. by Anne Marie Jauss, \$2.50. Describes habits, structure and life cycle of the insects, how to collect, identify and preserve them.

**THE FASCINATING WORLD OF ASTRONOMY**—Robert S. Richardson—*McGraw*, 274 p., illus., \$5.95. Written in the form of questions and answers, book treats selected subjects at some length, for the intelligent general reader.

**FOOD CHEMISTRY**—Lillian Hoagland Meyer—*Reinhold*, 385 p., illus., \$8.10. Written primarily as a text for the undergraduate student, it consolidates the fundamentals of food chemistry and recent advances in the food industry.

**FUEL CELLS**—G. J. Young, Ed.—*Reinhold*, 154 p., illus., \$5.75. Papers presented at symposium held by the Gas and Fuel Division of the American Chemical Society in 1959; book

covers design and principles of operation of various types of fuel cells, and their applications.

**GEODESY FOR THE LAYMAN**—Geo-Sciences Branch—*Aeronautical Chart & Info. Center USAF, (OTS)*, 83 p., illus., paper, \$2.25. Traces the development of geodesy from the third century B.C. to the first launching of earth satellites. Discusses figure of the earth, principles of geodetic surveying and geodetic systems.

**HOW THINGS GROW**—Herbert S. Zim—*Morrow*, 64 p., illus. by Gustav Schrotter, \$2.50. Introduces the young child to the factors that determine growth in crystals, plants, animals and man.

**ILLUSIONS AND DELUSIONS OF THE SUPERNATURAL AND THE OCCULT**—D. H. Rawcliffe, foreword by Julian Huxley—*Dover*, 551 p., illus., paper, \$2. Originally published under title "Psychology of the Occult." Critically evaluates such phenomena as water-divining, fire-walking, hypnotism, automatic writing and psychical research.

**KINGDOM OF THE OCTOPUS: The Life History of the Cephalopoda**—Frank W. Lane—*Sheridan*, 300 p., illus., 110 photographs, \$7.50. Brings together what is known about the octopus, cuttlefish and squids. A wealth of information, written in language the general reader can enjoy; 33-page bibliography included.

**MATHEMATICAL METHODS IN THE SOCIAL SCIENCES, 1959: Proceedings of the First Stanford Symposium**—Kenneth J. Arrow, Samuel Karlin and Patrick Suppes, Eds.—*Stanford Univ. Press*, 365 p., \$8.50. Papers are organized in three sections: economics, management science and psychology.

**OPERATION NOAH**—Charles Lagus—*Coward-McCann*, 176 p., photographs by author, \$4. Gives first-hand picture of the animal rescue work going on to save some of the wild species threatened by the waters of the Kariba Dam in Africa, which will form the largest man-made lake by 1963, covering an area as big as Long Island.

**THE RANDOM HOUSE VEST POCKET DICTIONARY OF SYNONYMS AND ANTONYMS**—Laurence Urdang, Ed.—*Random House*, 310 p., \$1.25. Compact, alphabetical, modern dictionary of more than 80,000 synonyms and antonyms of most commonly used English words.

**REGIONS, RESOURCES AND ECONOMIC GROWTH**—Harvey S. Perloff and others—*Johns Hopkins Press*, 716 p., illus., \$12. Survey of U. S. economic growth since 1870, discusses theories of growth, changes in distribution of population, natural resource activities, and analyzes the major causes of regional differentials in the rates of growth.

**RUNNERLESS MOLDING**—Ernest P. Moslo—*Reinhold*, 162 p., illus., \$4.95. Concise survey of the theory, design, applications and econom-

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**SATURDAY SCIENCE**—Andrew Bluemle, Ed., foreword by Clarence Zener—Dutton, 333 p., illus., \$5.95. Lectures on basic scientific concepts and current developments, as presented by scientists of the Westinghouse Research Laboratories to gifted high school seniors, members of the Science Honors Institute, invited Saturday mornings to stretch their imagination with glimpses into future scientific research.

**SAY IT WITH YOUR CAMERA: An Approach to Creative Photography**—Jacob Deschin—Ziff-Davis, rev. ed., 258 p., photographs, \$4.95. Outlines specific ways in which the amateur photographer can improve his pictures.

**SCIENCE IN SPACE, Chapter IX: The Biological Sciences and Space Research**—Joshua Lederberg and H. Keffler Hartline—Nat. Acad. of Sciences-Nat. Res. Council, 19 p., paper, \$1. Discusses exobiology, the experimental approaches to life beyond the earth.

**A STRUCTURE OF SCIENCE**—Joseph H. Simons—Philosophical Lib., 269 p., \$4.75. A chemist's attempt to fit science into the framework of human knowledge and experience.

**THERMAL ENGINEERING**—Harry L. Solberg, Orville C. Cromer and Albert R. Spalding—Wiley, 649 p., illus., \$9.50. Textbook is revision and extension of "Elementary Heat Power" by the same authors, intended to serve as an introduction to courses in thermodynamics, fluid mechanics and heat transfer.

**TO KNOW THE DIFFERENCE**—Albert D. Ullman—St. Martins, 239 p., \$4.75. Sociologist discusses case histories, attitudes and customs, relevant theories on alcoholism. Indicates the social points when treatment should begin.

**TOWARDS A UNIFIED COSMOLOGY**—Reginald O. Kapp—Basic Bks., 303 p., \$6.50. An engineer's attempt to bring all physical phenomena within one simple, unified scheme.

**TRAVELS AND TRADITIONS OF WATERFOWL**—H. Albert Hochbaum—Branford, 301 p., illus. by author, \$6. For layman and ornithologist, tells how waterfowl live on Delta marshes in Manitoba, discusses seasonal migratory flights, influence of weather, awareness of direction and dimensions of travel. Bibliography and nomenclature of birds included.

**WALT DISNEY'S BEAVER VALLEY**—Text by Georges Blond, transl. by Frances Frenaye—Simon & Schuster, 83 p., color photographs, 30. Swiss color printing makes this a very beautiful volume of nature study.

• Science News Letter, 78:140 August 27, 1960

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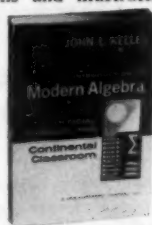
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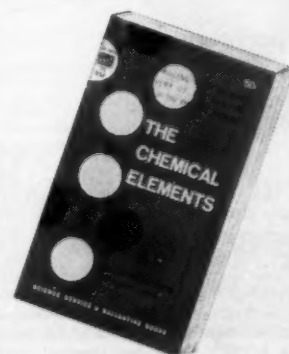
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► IF MAN SURVIVES the initial blasts, fires and other dangers of nuclear war, his long-term survival, even in countries directly attacked, seems possible.

This is the conclusion of Columbia University scientists engaged in a world-wide study being made of the concentration of radioactive fallout in the bone structure of man. Since the start of the study in 1953, about 9,000 samples of human bone have been obtained. The program is supported by the Division of Biology and Medicine of the U. S. Atomic Energy Commission.

The scientists say in the fourth report of "Strontium-90 in Man" that human bones would probably not collect as much strontium-90 as had been estimated earlier. Strontium-90 is an isotope produced and released into the atmosphere by nuclear explosions.

The isotope's ability to kill when collected in quantity in the human body has been one of the major reasons to fear for the long-term survival of man after a nuclear attack.

Publishing their report in *Science*, 132: 448, 1960, the scientists say also that the quantity of strontium-90 in the stratosphere from bomb tests is much less than previously estimated.

Dr. J. Laurence Kulp, director of the geochemistry section of Columbia's Lamont Geological Observatory in Palisades, N. Y.; Dr. Arthur R. Schulert, research associate at the Observatory; and Miss Elizabeth J. Hodges, research assistant at Lamont, prepared the report.

The study concludes that "if 3,000 megatons of fission (an explosive force equal to 3,000 million tons of TNT) were detonated in the Northern Hemisphere, it is probable that, away from the areas of local and immediate fallout, the long-term strontium-90 level in the diet would reach about 180 micro microcuries per gram of calcium, or an equilibrium bone level of 45 micro microcuries.

"Thus, under these extreme conditions, the contamination of non-combatant areas

would raise the average level of strontium-90 in the population to the point at which the bone dose from natural sources would be approximately doubled (0.60 micro microcuries).

"Food grown in the area of intermediate fallout—a large portion of the United States—would yield an equilibrium of strontium-90 in the diet in the range of 40 to 4,000 micro microcuries per gram of calcium.

"These concentrations would produce bone levels up to the maximum permissible concentration for industrial workers even if no special measures were taken.

"Thus, long-term survival of large populations, even in the countries under attack, would appear to be feasible, provided the serious problem of short-term survival could be solved."

The scientists report that, from bomb tests already conducted, "the strontium-90 yet to be deposited is a small fraction of that already down, and the total surface deposit will reach a maximum in 1961."

• *Science News Letter*, 78:142 August 27, 1960

## MEDICINE

## Body's Disease Fighters May Cause Fatal Disease

► MORE AND MORE EVIDENCE is piling up to support the theory that the body's infection-fighting mechanism itself may be able to cause diseases, an editorial in the *Journal of the American Medical Association*, Aug. 13, 1960, asserts.

Normally, the antibody-producing cells serve as front-line defense against disease, but abnormal cells may be able to cause a chronic and sometimes fatal disorder known as Red Wolf Disease, or systemic lupus erythematosus (SLE).

Quoting Dr. William Dameshek, professor of medicine, Tufts University School of Medicine, Boston, the editorial says the evidence "seems convincing" and may mark "the beginning of a new era" in defining

the causes of other diseases, such as rheumatoid arthritis, Addison's disease and chronic pancreatitis.

The symptoms of Red Wolf Disease include fever, arthritis, joint pain and skin rash. Although it is more common among women than men, it is not a rare condition.

"We believe," Dr. Dameshek says, "there is sufficient evidence at hand to call SLE a complex autoimmune disorder with irregular involvement of various constituents of the blood and small blood vessels, thus resulting in a highly protean (changeable) disorder."

"Involvement at the beginning may be limited to one tissue, one organ or one blood cell constituent, with progressively greater involvement as time goes on. Finally, there is a widespread generalized disease with death ordinarily due to severe renal (kidney) disease."

Dr. Dameshek says the reasons groups of abnormal antibody-producing cells develop are "obscure."

• *Science News Letter*, 78:142 August 27, 1960

## PHYSICS

## New Tool Developed for Thermonuclear Research

► A TOOL expected to be of great value in research aimed at eventual control of the hydrogen bomb's fusion reactions for peaceful power has been developed by three University of Illinois scientists.

They report in the British scientific journal, *Nature*, 187:584, 1960, that the so-called spin energy resonance techniques may be "of value as a diagnostic tool in high-energy plasma research." Plasma is the name given to a gas that has nearly equal numbers of ions and electrons but is electrically neutral as a whole.

Making a plasma react through fusion is being tried in controlled thermonuclear research. Drs. T. C. Marshall, R. A. Kawcyn and L. Goldstein developed the nuclear and electron spin resonance method to detect shifts in a magnetic field. A magnetic field is believed to be the best "container" for extremely hot plasma undergoing fusion.

• *Science News Letter*, 78:142 August 27, 1960

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# Do You Know

A white-furred bat with bright canary-yellow lips, ears and fingers, *Ectophyllia alba* by name, has recently been collected in Panama.

Only 10% of the nicotine entering the body is absorbed if smokers do not inhale, but 90% is absorbed if they do.

New highways wear tires up to three times faster than well worn roads because older surfaces become coated with a smooth layer of dirt, oil, tar and rubber.

Fabrics to be used for re-entry parachutes in manned satellites may be woven from fine wire composed of nickel-chromium and cobalt-chromium alloys.

Leukemia kills 12,000 Americans each year, one every 45 minutes.

The Philippines is the third largest English-speaking nation, after the United States and the United Kingdom.

About 72% of all Americans see a doctor at least once a year, while six percent require 20 or more doctor visits.

## Questions

**AERONAUTICS**—How long did it take Capt. Klinger to reach ground after his jump? p. 131.

**ASTRONOMY**—What do the three moon maps depict? p. 131.

**PSYCHOLOGY**—How can velvet gloves help to cure cat phobia? p. 133.

Photographs: Cover, G. T. Schjeldahl Co.; p. 131, U. S. Air Force; p. 133, Chicago Natural History Museum; p. 144, Home Haircut Guide Co.

## Jupiter Still Conspicuous

(Continued from p. 135)

### Celestial Time Table for September

Sept.	EST	
4	3:00 a.m.	Moon passes north of Saturn
2	4:00 p.m.	Moon nearest, distance 226,400 miles
5	6:19 a.m.	Full moon, total eclipse of moon
13	5:20 p.m.	Moon in last quarter
12	5:00 a.m.	Moon passes south of Mars
14	1:00 p.m.	Moon farthest, distance 251,400 miles
10	6:13 p.m.	New moon, partial eclipse of sun
22	5:00 p.m. 8:00 p.m.	Moon passes north of Venus Sun over equator, autumn commences in Northern Hemisphere
27	5:00 a.m.	Moon passes north of Jupiter
8	13 p.m.	Moon in first quarter
28	9:00 a.m.	Moon passes north of Saturn
29	5:00 p.m.	Moon nearest, distance 229,400 miles

Subtract one hour for CST, two hours for MST and three for PST.

• Science News Letter, 78:134 August 27, 1960

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## LITTLE GIANT PRISM

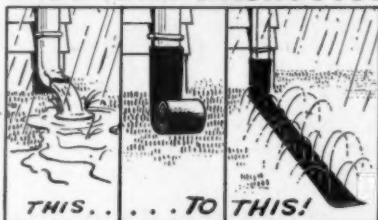


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# New Machines and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 1054. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

**FISHING GUIDE MAP**, printed in full color on a new plastic-coated paper, shows the principal game fish found in North America at more than 100 localities. The decorative map helps to locate the best fishing spots in the United States and adjacent waters. An index lists species likely to be found in each area.

• Science News Letter, 78:144 August 27, 1960

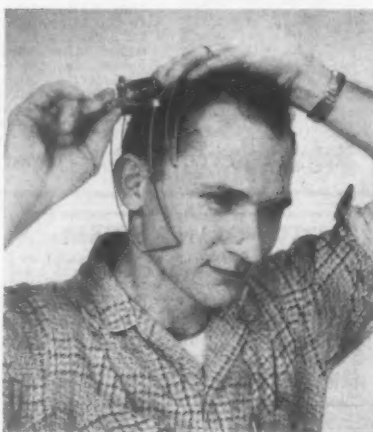
**ORAL RESUSCITATOR** permits mouth-to-mouth rescue breathing without personal contact. The rescue breather consists of a mouthpiece, breather tube, one-way valve and flexible face mask. The mask fits adults and children, and eliminates need to hold victim's nostrils.

• Science News Letter, 78:144 August 27, 1960

**INSECT TRAP** lures night-flying insects by means of an ultraviolet light. Then an electric fan draws them into an air stream and spins them down into a plastic bag, which is easily disposable. The device runs on standard house current.

• Science News Letter, 78:144 August 27, 1960

**HAIRCUTTING GUIDE**, shown in the photograph, enables anyone owning a safety razor to give himself or anyone else a professional looking haircut. In use, the safety



razor is inserted in an adaptor; the adaptor is mounted on the metal guide, which is placed over the head. One hand holds the guide, and the other hand moves the safety razor.

• Science News Letter, 78:144 August 27, 1960

**TELESCOPING BALL POINT PEN** is easily carried in handbag, purse, pocket, or attached to key chain. No bigger than a

lipstick tube when in its case, it telescopes out to 3 3/4 inches. The ball point pen comes in a leather carrying case.

• Science News Letter, 78:144 August 27, 1960

**SPRAY-COMB** spreads any beauty or health preparation smoothly and evenly without mess or waste. Skin oils, sun lotions or hair preparations are easily dispensed on skin or scalp through the fine openings of the comb from a built-in flask.

• Science News Letter, 78:144 August 27, 1960

**FOAM SHIPPING CONTAINER** includes a cored bottom and a fitted, hinged top, both cut from a single cube of black polyurethane foam. The container firmly nests and protects a delicate electronic part without the use of other protective packing. The whole packaging unit is reusable.

• Science News Letter, 78:144 August 27, 1960

**LIGHT GUARD** prevents fluorescent lamps from falling from their sockets. Made of spring steel, copper-coated wire, two prongs turn outward, while at the other end the wire is formed into a small rectangle, set at right angles to the prongs. Once installed, the device is never removed, even when lamps are changed. Two of the slip-on guards are used for each fixture.

• Science News Letter, 78:144 August 27, 1960



## Nature Ramblings



By HORACE LOFTIN

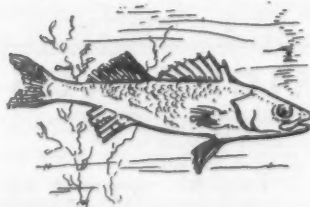
### Deep End of the Seine

► HAVE YOU EVER worked the deep end of a seine? This is the "glory" end, as any fish collector will tell you. Let the youths, the lame and the old work the shallow end. What care you for the chilly water that mounts to your waist, the pebbles that make you stumble and the water weeds that wrap around your legs.

It does take strong motivation to pull that deep end of a seine in a murky southern creek or a cold, swift northern brook. But your curiosity as an amateur fish collector is all the motivation anyone could ask for.

Fish collecting is a fast-growing field for the host of amateur naturalists and sportsmen who turn to nature for week-end relief from city concrete. It is a bit more complicated than the old stand-bys, insect collecting and bird watching. Permits must be obtained in most states, and you must have at least simple aquaria or carry preservatives for your specimens.

But there are certain satisfactions and



thrills in this "sport" not present in quite the same degree in any other outdoor hobby.

Fishing—any kind of fishing—has that unique moment when you lift your line or trap or net from the water to see what surprise may await you. You literally never know what each haul may bring up.

For the amateur, the net may hold a rare specimen for the aquarium, a new fish for his "life list" or perhaps a new record of a species for his region of the country. There are many kinds of fishes in almost every

lake, stream or river, and it is a challenge to learn to identify them.

Soon the beginning amateur learns not only what fishes occur in his area, but where each may be expected to occur—in what kind of water, what kind of bottom, swift creek or sluggish river. He learns when the young appear, what different fishes eat and what their relationships are with other animals and plants. In short, he comes to understand more about the world of nature as a whole through close observation of a fascinating fragment of nature.

It takes little equipment and less trouble to get into this outdoor hobby. A small-meshed minnow seine about 10 feet in length is plenty for a start, and your local book store will have excellent field guides to the fishes of your region, or can get them for you in a hurry. Before you hit the water, though, check with your state conservation department or game warden about a collector's permit.

• Science News Letter, 78:144 August 27, 1960

